

ROADWAY SAFETY

I. PROGRAM OVERVIEW

The Roadway Safety program focuses on the operating environment. Grant funds provide necessary equipment and facilities to aid in the identification and analysis of critical locations, the recommendation of traffic safety enhancements and the improvement of the traffic flow to ensure that responsible agencies have the technical expertise to perform necessary analyses. Roadway design, construction, and maintenance are not permissible under the Office of Traffic Safety (OTS) grant program.

OTS has continued the “Safety Through Construction and Maintenance Zones” training program. Utilizing this program, trainers are sent to locations throughout the state to provide two-day training sessions that instruct roadway maintenance and construction personnel on the latest methodology for enhancing the safety of workers and motorists in those areas receiving maintenance or which are under construction. The program is utilized extensively by many local agencies, public utility companies, and private firms. The Federal Highway Administration (FHWA) has specifically encouraged continuation of the program. Generally, this program is renewed every three years. The continuous turnover of highway construction and maintenance personnel assures a continuing need for this education program. Continuation of the program ensures that suitable training is available to enhance roadway safety through construction and maintenance zones.

A sound traffic-engineering program utilizes collision location data, an inventory of traffic control devices, data on the numbers and types of driving lanes, average and peak hour traffic volumes, and data on the direction of travel. In addition, a cogent traffic-engineering program should also include traffic circulation pattern information and data on adjacent land use. There should also be an ability to identify and analyze critical collision locations to establish reasonable speed limits (85th percentile), to coordinate and optimize signal timing, and to correlate all of the referenced data with the types and severity of collisions experienced. The engineer must perform analyses and recommend mitigation in the way of traffic controls, roadway design changes, alternative routes, and non-engineering (enforcement) improvements.

In some instances, increased tort liability actions are a motivating factor responsible for compelling agencies to improve their engineering analysis capabilities. Consequently, the nature of traffic engineering efforts must be proactive. In addition, complete traffic-engineering efforts must offer long-term mitigation to identified conditions.

II. ACTION PLANS

Traffic Control Device Inventory (TCDI)

This activity involves establishing a relational database for the storage and retrieval of various control device data elements. Agencies must perform a complete field inventory of existing signs, signals, pavement and curb markings and stripping as well as the condition of each. Depending upon the size and complexity of the street layout table, some inventories may exclude certain items, such as pavement and curb stripping, and may keep separate inventories for some items, such as signals.

Traffic Counts

This activity typically involves the purchase of traffic counting devices including radar trailers and the development of a schedule for their periodic and regular deployment. Depending on the sophistication of the count devices and the agency, traffic counts may also include the incorporation and the development of traffic flow pattern charts to illustrate relative traffic volumes. Traffic counts should also include average daily traffic (ADT) and peak hour volume counts.

Identification and Surveillance

This process allows for the systematic identification and ranking of critical or high collision locations within the jurisdiction and for performing analyses to discover conditions that may be contributing to the high collision rates. Software applications frequently include the generation of collision diagrams with Primary Collision Factors (PCF) identified. Applications may also include such functions as traffic flow analyses, traffic circulation patterns, and the statistical correlation of conditions present at the time of the collisions e.g., weather, time of day etc. In more sophisticated systems, collision locations can be identified as mid-block or intersection.

Bicycle and Pedestrian Safety

In this activity, there is commonly one point of focus, either on bicycle safety or pedestrian safety. Bicycle safety typically involves analyzing bicycle collisions and bicycle travel patterns to determine the relative benefits of including bicycle lanes, special signage or the prohibition of bicycles from certain roadways. Pedestrian safety is most commonly associated with the development of "Recommended Route to School" maps or performing analyses to determine the probable benefits from the installation of signalized pedestrian crosswalks. Related to the latter, mitigation is the on-going evaluation of a recently developed device that enables pedestrians to alert motorists to their presence. The alert is achieved via In-Roadway Warning Lights (IRWL's) LED lights. The California Traffic Control Device Committee (CTCDC) and the California Department of Transportation (Caltrans) have developed standards for these devices making them available to cities and counties in a non-experimental capacity throughout the state via OTS grant process.

Many engineering and enforcement agencies are still employing the use of manual collision and citation tracking systems or are forced to use unwieldy legacy data systems. Extracting meaningful data through either practice is an arduous and inefficient undertaking and the resulting data may be unreliable. For instance, jurisdictions that share a common boundary may find that crashes on the boundary roadways are undercounted (counted by the wrong agency) or double-counted (by multiple agencies). Either way, the data integrity is compromised. In addition, neither a manual system nor legacy system provides a viable and efficient means for communicating captured data on either an intra-agency or inter-agency level. This inability to share data results in the perpetuation of separate engineering and enforcement data systems in these jurisdictions. By developing modern open data systems that are usable by both traffic engineering and enforcement within a city and/or across jurisdictional lines i.e., county-to-county, OTS is providing an opportunity to enhance not only data sharing but overall communication and agency efficiency.

Geographical Information System (GIS)

These systems involve extensive use of sophisticated and powerful software and hardware. Most applications locate data (collisions, citations, signage) by a unique geographical identifier (geocoding), usually points of longitude and latitude and employ software such as AutoCAD or ArcView. GIS incorporates the use of a wide variety city/county relevant of data layers though many of the developed layers may be unrelated to traffic (such as census tracts, tax parcels, sewer lines, etc.); typically GIS will employ the use of global positioning satellite (GPS) transceivers. GPS technology directs signals to low orbit global satellites where the signal is then triangulated to a unique (specific) location on the earth's surface. Depending on the complexity of the community, the local funds the agency is willing to commit and the proposed uses of the systems, GIS offers a flexible and appropriate solution for a variety of identified traffic mitigation programs. OTS has assisted many jurisdictions throughout the state in implementing Geographic Information Systems applications. Numerous cities and counties throughout the state have implemented GIS in their jurisdiction and many more are in the process of implementing GIS programs for their agency.

During this fiscal year, OTS intends to initiate more grants involving Geographic Information Systems. In a planned effort, OTS intends to automate manual processes and replace legacy data systems that are no longer efficient or effective. OTS will promote implementation of these systems on a county level and on a city level in the "wired" counties.

Training and Review

The Safety Through Construction and Maintenance Zones and the Engineering and Enforcement (E&E) Team programs are funded through the Institute for Transportation Studies (ITS) of the University of California, Berkeley. Both programs have received national recognition for their excellence.

With the advancements being made in data automation and the increased number of software packages related to traffic engineering and mapping, the scope of engineering in the OTS grant program has changed markedly from just a few years ago. As the concept of GIS continues to mature, the delineation between traffic records and traffic engineering is rapidly blurring and will likely disappear completely very soon. Traffic record systems are becoming increasingly comprehensive, providing data storage and retrieval mechanisms that apply to both engineering and enforcement, as well as to other interested organizations. For this reason, many projects may appear to be traffic record projects when they are in fact, engineering projects. Since both disciplines may be using the same computerized database, the degree to which the project requires applied engineering fieldwork is used to distinguish between traffic records and traffic engineering.

III. TASKS

TASK 1 - PROGRAM DEVELOPMENT AND ADMINISTRATIVE COORDINATION

This task provides for the necessary staff time and expenses incurred by OTS that are directly related to the planning, development, coordination, monitoring, auditing, and evaluation of projects within this program area, and the preparation of the 2006 Highway Safety Plan. Funding is also provided in this task for the printing of brochures and

pamphlets, distributing literature and media materials developed through successful projects, or obtained from other sources. Assistance is also provided under this task for individuals to attend and participate in technology transfer workshops, training sessions, or educational meetings and conferences.

TASK 2 - ELECTRONIC ENGINEERING DATA SYSTEMS

Projects funded in this task provide local agencies with the ability to collect, extract and manipulate traffic collision and citation data. Utilizing these high-powered data systems will enable these agencies to conduct thorough collision/citation analyses that will allow for statistically meaningful and technically accurate graphical representations. These systems will be used to track data throughout the locality to evaluate high collision/citation locations upon which to base mitigation efforts or other capital improvement decisions. In addition, these systems will also allow for information sharing between and amongst local jurisdictions along shared boundaries to effectively identify and classify collisions or other traffic related data by geographical reference points. Four grants will be continued into 2005, and five new grants will be initiated.

Project #	Fund	Agency	Equipment	FFY 2006 Funds
RS0414	157	Torrance	N/A	\$60,000
RS0601	157	Santa Clara	N/A	\$39,370
RS0602	157	Anderson	Automated GIS Collision Analysis & Tracking System	\$25,500
RS0605	157	Shasta County	Automated GIS Collision Analysis & Tracking System	\$25,925
RS0614	157	San Diego County	Automated GIS Collision Analysis & Tracking System	\$30,000
RS0617	157	Plumas County	GIS Traffic Control Device Inventory Program	\$40,000
RS0619	157	Camarillo	GPS Locator	\$75,000
RS0623	157	Butte County	Automated GIS Collision Analysis & Tracking System	\$206,000
RS0407	163	Los Angeles	Automated GIS Collision Analysis & Tracking System	\$546,508
RS0515	402	Elk Grove	N/A	\$0
RS0516	402	Fresno County	N/A	\$42,427
RS0524	402	Ukiah	N/A	\$0

TASK 3 - ROADWAY IMPROVEMENT PROGRAM

Projects funded in this task enable local agencies to implement minor improvements in the roadways, as authorized by FHWA, including the installation of traffic count programs. No projects have been funded in this task for fiscal year 2006.

TASK 4 - TRAFFIC ENGINEERING EXPERTISE

Projects funded in this task enable agencies to better identify problems, suggest alternative solutions, and identify future needs by providing the traffic engineering expertise required. It also provides a professional engineer to the UC Berkeley Enforcement and Engineering Analysis Team, to conduct at least 35 annual administrative evaluations of local traffic engineering and enforcement programs. Funding for these projects is reflected in program area PT, Task 4.

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PT0605 - UNIVERSITY OF CALIFORNIA, BERKELEY

TRAFFIC SAFETY EVALUATIONS FOR CALIFORNIA COMMUNITIES

Initiated in fiscal year 2004, the project is continued into fiscal year 2004. This project will provide technical expertise to execute local traffic engineering and enforcement analysis. The program will be active throughout the State of California. Evaluation visits will be made by teams of experts for the ITS Tech Transfer Program. Written analyses documenting the findings and recommendations are provided to host governments. The project also supports the organization of an annual statewide workshop on safety topics of interest to both enforcement and engineering professionals to highlight best practices and encourage information sharing across communities and among disciplines. Funding for this grant is shown in Police Traffic Services. (\$244,382)

TASK 5 - EDUCATION AND TRAINING

Projects funded in this task provide training for enhanced roadway safety. Funds are also obligated for the training of persons responsible for collision investigation and analysis.

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RS0606 - UNIVERSITY OF CALIFORNIA, BERKELEY

WORK ZONE SAFETY TRAINING

This new project is planned for fiscal year 2006. The project seeks to reduce the number and severity of crashes at or near public highway work zones by training construction and maintenance crews on how to safely, effectively and efficiently plan, install, and operate work zone controls that minimize potential for vehicle conflicts with pedestrians, bicycles, hazards, and to protect workers. The project will organize and deliver the existing revised MUTCD compliant class called "Safety and Traffic Control Plans for Work Zones" to host agencies and organizations for a reduced fee. The project will also evaluate course content and will update as needed. (\$201,548)

**RS0008 - CALIFORNIA DEPARTMENT OF TRANSPORTATION
TRAFFIC SAFETY AUDIT PROJECT**

Initiated in fiscal year 2000, the current project is continued into fiscal year 2006. Road Safety Audits is a program initiated by the Federal Highway Administration. The FHWA currently has fourteen states participating in its Road Safety Audits program. The program undertakes a formalized examination of an existing or future road or traffic project that interacts with road users. In this process independent, qualified examiners study a roadway and report on the collision potential and safety performance of the roadway. (\$0)

**RS0504 – CALIFORNIA DEPARTMENT OF TRANSPORTATION
HIGHWAY WORK ZONE SAFETY PUBLIC AWARENESS CAMPAIGN**

This project continues in FFY 2006. This project expands on a pilot project for work zone safety public awareness campaign statewide. The campaign builds on the prior campaign by expanding into areas of California that were not covered in the pilot campaign. The Department continues to survey the impact of the campaign on public awareness and analyze existing work zone collision data to determine whether the campaign continues to be successful in reducing work zone collisions and whether a cost benefit analysis supports permanently continuing this campaign statewide. (\$1,816,712)

**RS0514 – DEPARTMENT OF MOTOR VEHICLES
TRAFFIC SAFETY EDUCATION PROJECT**

This project is provided continued funding for fiscal year 2006, to assist will compliance with for Americans with Disabilities Act of 1992 by updating and combining DMV's first two videos entitled "Rules of the Road" and "Safe Driving Practices." The new combined video will enhance driver competency by providing a current video resource to reach people who are illiterate or have reading or other learning disabilities. In addition, this tape will also be suitable for DMV applicants for whom English is their second language. (\$75,090)

TASK 6 - EQUIPMENT

Projects funded in this task provide equipment for grantees to reduce the number of fatal and injury collisions in their jurisdiction. The hardware provided under this task tends to be specialized and designed to address an identified traffic safety issue in the jurisdiction. Including but not limited to speed trailers, speed feedback signs and changeable message signs.

Project #	Fund	Agency	Equipment	FFY 2006 Funds
RS0603	157	Milpitas Engineering Department	Vehicle Speed Feedback Signs and GIS System	\$76,800
RS0604	157	Fairfield	Vehicle Speed Feedback Signs and Flashing Beacons	\$67,710
RS0609	157	Los Angeles County	10 Radar Speed Trailers	\$160,000
RS0610	157	Napa	Vehicle Speed Feedback Signs	\$51,000

Project #	Fund	Agency	Equipment	FFY 2006 Funds
RS0611	157	Cupertino	Advance School Flashing Beacons and In-Roadway Warning Lighting System	\$44,100
RS0615	157	Kern County	Hand held Citation Devices	\$100,000
RS0616	157	La Mesa	Vehicle Speed Feedback Signs	\$35,000
RS0618	157	San Marcos	Vehicle Speed Detectors and Flashing Beacons	\$108,900
RS0621	157	Rialto	Vehicle Speed Feedback Signs (2)	\$17,500
RS0624	157	Merced County	In Pavement Lighting	\$75,000
RS0626	157	Camarillo	Vehicle Speed Feedback Signs (6)	\$50,000
RS0627	157	Pico Rivera	Vehicle Speed Feedback Signs (10)	\$100,000
RS0628	157	Yorba Linda	Vehicle Speed Calming Display Units (4)	\$45,000
RS0502	402	County of Alameda-Public Works	N/A	\$0
RS0505	402	Campbell-Public Works	N/A	\$0
RS0507	402	Fontana-Public Works	Speed Feedback Signs	\$70,000
RS0513	402	Ventura County-Public Works	Speed Feedback Signs In-road Warning Lights	\$127,000
RS0518	402	Rancho Palos Verdes-Public Works	Speed Feedback Signs and Radar Trailer	\$30,000
RS0519	402	County of Santa Clara-Public Works	N/A	\$26,660
RS0522	402	Stockton-Public Works	Speed Feedback Signs	\$61,040
RS0526	402	Yolo County	Flashing Beacon Signs and Speed Feedback Signs	\$0

TASK 7 - EVALUATION

There are currently no projects planned or continued under this task.

TASK 8 - INFRASTRUCTURE IMPROVEMENT

The Caltrans Highway Safety Improvement Program (HSIP) includes all projects in which the primary purpose is to reduce the number and severity of collisions on California highways. Projects may range from spot improvements such as new signal installations to statewide systematic improvements to Clean Up the Roadside Environment (CURE).

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HAZARD ELIMINATION PROJECTS

The following are hazard elimination projects scheduled for 2006 and funded through the California Department of Transportation (Caltrans).

- Upgrade and install metal beam guardrails and end treatments in Los Angeles County. (\$2,293,000)
- Install icy curve warning system in Plumas County. (\$1,223,500)
- Install guardrail/remove trees and shrubs within 30 feet of the edge of traveled way. (\$2,500,000)
- Upgrade/relocation lighting standards in Long Beach. (\$200,000)
- Install concrete barrier in the City of Los Angeles. (\$750,000)
- Install chain link railing in the City of Los Angeles. (\$725,000)
- Install chain link railing in the City of Commerce. (\$282,500)

**FISCAL YEAR 2006 PROGRAM FUNDING
(ROADWAY SAFETY)**

RS Task	Title	Major Cost Items				
1	Program Development and Administrative Coordination	Personnel, Travel, Contracts, Printing				
2	Electronic Engineering Data Systems	Computer Hardware and Software, Contractual Services				
3	Roadway Improvement Program	Computer and Traffic Count Equipment				
4	Traffic Engineering Expertise	Personnel, Travel, Contractual Services, Operating Expenses				
5	Education and Training	Personnel, Travel, Operating Expenses, Contractual Services				
6	Equipment	Air Velocity Deer Whistles, In-Pavement Lighting Systems				

Task # / Agency	Funding Sources/Codes					
	157	163	164AL	402	410	411
1 Local	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
State	\$0.00	\$0.00	\$0.00	\$76,651.00	\$0.00	\$0.00
2 Local	\$451,666.00	\$0.00	\$0.00	\$19,300.00	\$0.00	\$0.00
State	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
3 Local	\$100,000.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
State	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
4 Local	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
State	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
5 Local	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00	\$0.00
State	\$201,548.00	\$1,891,802.00	\$0.00	\$0.00	\$0.00	\$0.00
6 Local	\$805,160.00	\$546,508.40	\$0.00	\$87,700.00	\$0.00	\$0.00
State	\$0.00	\$101,103.71	\$0.00	\$0.00	\$0.00	\$0.00

**FISCAL YEAR 2006 PROGRAM FUNDING
(ROADWAY SAFETY)**

RS Task	Title			Major Cost Items		
7	Infrastructure Improvement			Contractual Services		